What is claimed is:

1. A reinforcing structure adapted for use in the manufacture of a pultruded part where the reinforcing structure is pulled through a pultrusion die in a continuous longitudinal pull direction, the reinforcing structure comprising:

a permeable transport web of staple fibers; and

a plurality of first reinforcing fibers attached to the permeable transport web such that the portion of the first reinforcing fibers extending in a transverse direction comprises at least 40% of a volume of materials comprising the reinforcing structure.

2. The reinforcing structure of claim 1 wherein the portion of the first reinforcing fibers extending in the transverse direction comprises at least 50% of a volume of materials comprising the reinforcing structure.

3. The reinforcing structure of claim 1 wherein the first reinforcing fibers comprise one or more overlapping layers of first reinforcing fibers.

4. The reinforcement structure of claim 1 wherein the staple fibers comprise a length of about ½ inch to about 4 inches.

5. The reinforcement structure of claim 1 wherein the staple fibers comprise a length of about 0.01 inch to about 12 inches.

6. The reinforcement structure of claim 1 wherein the staple fibers comprise a weight of about 60 grams per square meter to about 300 grams per square meter before attachment to the first reinforcing fibers.

7. The reinforcement structure of claim 1 wherein the staple fibers comprise a weight of about 10 grams per square meter to about 1200 grams per square meter before attachment to the first reinforcing fibers.

8. The reinforcing structure of claim 1 wherein the permeable transport web comprises heat-fusible fibers.

9. The reinforcing structure of claim 1 wherein the permeable transport web comprises at least two different polymeric fibers, each comprising a different glass transition temperature.

10. The reinforcing structure of claim 9 wherein the at least two polymeric fibers comprise a glass transition temperature of about 350°F and about 270°F, respectively.

11. The reinforcing structure of claim 1 wherein the permeable transport web comprises:

a plurality of first polymeric fibers comprising a first glass transition temperature; and

a plurality of bi-component fiber wherein a first component comprises the first glass transition temperature and a second component comprises a second glass transition temperature less than the first glass transition temperature.

12. The reinforcing structure of claim 11 wherein the bi-component fibers comprise a core-sheath configuration.

13. The reinforcing structure of claim 1 comprising in-plane mechanical and directional stability.

14. The reinforcing structure of claim 1 wherein the permeable transport web comprises a plurality of fibers at least a portion of which are randomly entangled with the first reinforcing fibers.

15. The reinforcing structure of claim 1 wherein the permeable transport web comprises a plurality of fibers at least a portion of which are thermally bonded to the first reinforcing fibers.

16. The reinforcing structure of claim 1 wherein the first reinforcing fibers are spaced apart and attached together by a continuous stitching fiber.

17. The reinforcing structure of claim 16 wherein the stitching fiber comprises glass fibers, natural fibers, carbon fibers, metal fibers, ceramic fibers, synthetic or polymeric fibers, composite fibers including one or more components of glass, natural materials, metal, ceramic, carbon, and/or synthetics components, or a combination thereof.

18. The reinforcing structure of claim 1 comprising a binder attaching the permeable transport web to the first reinforcing fibers.

19. The reinforcing structure of claim 18 wherein the binder comprises one or more of a specialized latex binder diluted in a water carrier, a polyvinyl acetate emulsion, or a crosslinking polyvinyl acetate emulsion.

20. The reinforcing structure of claim 1 comprising a plurality of perforations through the permeable transport web and extending between the first reinforcing fibers.

21. The reinforcing structure of claim 1 comprising a permeability of at least 180 ft^3/minute/ft^2 as measured according to the procedure of ASTM D737-96 with a pressure differential of about 0.5 inch column of water.

22. The reinforcing structure of claim 1 comprising a permeability of about 300 ft^3/minute/ft^2 as measured according to the procedure of ASTM D737-96 with a pressure differential of about 0.5 inch column of water.

23. The reinforcing structure of claim 1 comprising a permeability of more than 350 ft^3/minute/ft^2 as measured according to the procedure of ASTM D737-96 with a pressure differential of about 0.5 inch column of water.

24. The reinforcing structure of claim 1 comprising a circular bending stiffness of at least about 4 Newtons as measured according to the procedure of ASTM D4032-94.

25. The reinforcing structure of claim 1 comprising a circular bending stiffness in a range of about 4 Newtons to about 15 Newtons as measured according to the procedure of ASTM D4032-94.

26. The reinforcing structure of claim 1 comprising a thickness of about 0.004 inches to about 0.020 inches.

27. The reinforcing structure of claim 1 comprising a thickness of about 0.010 inches to about 0.012 inches.

28. The reinforcement structure of claim 1 wherein the reinforcement structure comprises a tensile strength in the transverse direction of about 200 lbs/inch as measured using the procedure of ASTM D76-99.

29. The reinforcement structure of claim 1 wherein the reinforcement structure comprises a tensile strength in the pull direction of at least 6 lbs/inch as measured using the procedure of ASTM D76-99.

30. The reinforcing structure of claim 1 wherein the first reinforcing fibers comprise glass fibers, natural fibers, carbon fibers, metal fibers, ceramic fibers, synthetic or polymeric fibers, composite fibers (including one or more components of glass, natural materials, metal, ceramic, carbon, and/or synthetics components), or a combination thereof.

31. The reinforcing structure of claim 1 wherein the first reinforcing fibers comprise at least one polymeric component.

32. The reinforcing structure of claim 1 wherein the first reinforcing fibers comprise a surface treatment including an organosilane agent.

33. The reinforcement structure of claim 32 wherein the organosilane agent comprises one or more families of a cationic amino-functional silane, Tris (2- methoxyethoxyvinylsilane), or 3-methacryloxypropyltrimethoxysilane.

34. The reinforcing structure of claim 1 wherein the transverse direction comprises a direction about 90° +/- 10° relative to the pull direction.

35. The reinforcing structure of claim 1 wherein the transverse direction comprises a direction about 90° +/- 5° relative to the pull direction.

36. The reinforcing structure of claim 1 wherein substantially all of the first reinforcing fibers extend continuously across a width of the reinforcing structure.

37. The reinforcing structure of claim 1 comprising a plurality of permeable transport webs.

38. The reinforcing structure of claim 1 comprising a plurality of second reinforcing fibers extending at one or more acute angles relative to the pull direction.

39. The reinforcing structure of claim 1 comprising a plurality of second reinforcing fibers extending at a first acute angle relative to the pull direction and a plurality of third reinforcing fibers extending at a second acute angle that is the negative of the first acute angle.

40. The reinforcing structure of claim 39 comprising a plurality of fourth reinforcing fibers extending in the pull direction.

41. The reinforcing structure of claim 39 wherein the first reinforcing fibers are located between the second and third reinforcing fibers.

42. The reinforcing structure of claim 1 comprising a plurality of second reinforcing fibers extending at a first acute angle relative to the pull direction, a plurality of third reinforcing fibers extending at a second acute angle that is the negative of the first acute angle, and a plurality of fourth reinforcing fibers extending generally in the pull direction.

43. The reinforcing structure of claim 42 wherein the permeable transport web comprises a plurality of fibers at least a portion of which are randomly entangled with one or more of the first, second, third or fourth reinforcing fibers.

44. The reinforcing structure of claim 42 wherein the permeable transport web comprises a plurality of fibers at least a portion of which are thermally bonded with one or more of the first, second, third or fourth reinforcing fibers.

45. The reinforcing structure of claim 42 wherein the first reinforcing fibers are stitched with one or more of the permeable transport web, the second reinforcing fibers, the third reinforcing fibers, and the fourth reinforcing fibers.

46. The reinforcing structure of claim 42 comprising a binder attaching the permeable transport web to one or more of the first, second, third or fourth reinforcing fibers.

47. The reinforcing structure of claim 42 wherein one or more of the first, second, third or fourth reinforcing fibers comprise a polymeric component.

48. The reinforcing structure of claim 42 wherein the first reinforcing fibers are located between the second and third reinforcing fibers and the fourth reinforcing fibers.

49. The reinforcing structure of claim 42 wherein the first, second, third or fourth reinforcing fibers comprise discrete layers.

50. A reinforcing structure adapted for use in the manufacture of a pultruded part where the reinforcing structure is pulled through a pultrusion die in a continuous longitudinal pull direction, the reinforcing structure comprising:

a permeable transport web of staple fibers; and

a plurality of first reinforcing fibers oriented in a transverse direction attached to the permeable transport web such that a ratio of a modulus of elasticity of the reinforcing structure in the transverse direction relative to a modulus of elasticity in the pull direction comprises at least 1.2.

51. The reinforcing structure of claim 50 wherein the ratio of the modulus of elasticity of the reinforcing structure in the transverse direction relative to the modulus of elasticity in the pull direction comprises at least 1.5.

52. The reinforcing structure of claim 50 wherein the ratio of the modulus of elasticity of the reinforcing structure in the transverse direction relative to the modulus of elasticity in the pull direction comprises at least 3.

53. The reinforcing structure of claim 50 wherein the ratio of the modulus of elasticity of the reinforcing structure in the transverse direction relative to the modulus of elasticity in the pull direction comprises at least 5.

54. A reinforcing structure adapted for use in the manufacture of a pultruded part where the reinforcing structure is pulled through a pultrusion die in a continuous longitudinal pull direction, the reinforcing structure comprising:

a permeable transport web of staple fibers; and

a plurality of non-overlapping first reinforcing fibers attached to the permeable transport web such that the portion of the first reinforcing fibers extending in a transverse direction comprises at least 30% of a volume of materials comprising the reinforcing structure.

55. A reinforcing structure adapted for use in the manufacture of a pultruded part where the reinforcing structure is pulled through a pultrusion die in a continuous longitudinal pull direction, the reinforcing structure comprising:

a plurality of first reinforcing fibers generally oriented in a transverse direction;

a permeable transport web attached to the first reinforcing fibers, the permeably reinforcing sheet comprising;

a plurality of first polymeric fibers comprising a first glass transition temperature; and

a plurality of bi-component fiber wherein a first component comprises the first glass transition temperature and a second component comprises a second glass transition temperature less than the first glass transition temperature.

56. A reinforcing structure adapted for use in the manufacture of a pultruded part where the reinforcing structure is pulled through a pultrusion die in a continuous longitudinal pull direction, the reinforcing structure comprising:

a plurality of first reinforcing fibers oriented in a transverse direction; and

a permeable transport web thermally bonded to the first reinforcing fibers so that the reinforcing structure comprises a permeability of at least 180 ft^3/minute/ft^2 as measured according to the procedure of ASTM D737-96 with a pressure differential of about 0.5 inch column of water.

57. A reinforcing structure adapted for use in the manufacture of a pultruded part where the reinforcing structure is pulled through a pultrusion die in a continuous longitudinal pull direction, the reinforcing structure comprising:

a plurality of first reinforcing fibers oriented at 45° (+/- 15°) relative to the pull direction;

a plurality of second reinforcing fibers oriented at -45° (+/- 15°) relative to the pull direction; and

a permeable transport web of staple fibers attached to the first and second reinforcing fibers such that the first and second reinforcing fibers comprises at least 30% of a volume of materials comprising the reinforcing structure.

58. A reinforcing structure adapted for use in the manufacture of a pultruded part where the reinforcing structure is pulled through a pultrusion die in a continuous longitudinal pull direction, the reinforcing structure comprising:

a plurality of first reinforcing fibers oriented at 60° (+/- 15°) relative to the pull direction;

a plurality of second reinforcing fibers oriented at -60° (+/- 15°) relative to the pull direction; and

a permeable transport web of staple fibers attached to the first and second reinforcing fibers such that the first and second reinforcing fibers comprises at least 30% of a volume of materials comprising the reinforcing structure.

59. A reinforcing structure adapted for use in the manufacture of a molded part where the reinforcing structure is formed in a die having a longitudinal axis, the reinforcing structure comprising:

a permeable transport web of staple fibers; and

a plurality of first reinforcing fibers attached to the permeable transport web such that the portion of the first reinforcing fibers extending in a transverse direction comprises at least 40% of a volume of materials comprising the reinforcing structure.

60. A reinforcing structure adapted for use in the manufacture of a pultruded part where the reinforcing structure is pulled through a pultrusion die in a continuous longitudinal pull direction, the reinforcing structure comprising:

a permeable transport web of staple fibers; and

a plurality of first reinforcing fibers extending in a transverse direction continuously across a width of the reinforcing structure and attached to the permeable transport web.

61. A reinforcing mat adapted for use in manufacture of a pultruded part where the reinforcing mat is pulled with longitudinal fibers through a pultrusion die in a continuous longitudinal pull direction, the reinforcing mat comprising:

a body presenting a pair of opposed outer surfaces defining the thickness of the reinforcing mat;

the body including elongated reinforcing fibers oriented in a first direction transverse to the pull direction;

the body including transport components thereof arranged to provide longitudinal strength, shear strength and anti-skewing resistance sufficient to allow

the reinforcing mat to be carried through the pultrusion die with the longitudinal fibers; and

and the body including entangling fibers defined by at least portions of staple fibers that extend through at least a portion of the thickness, the staple fiber portions being entangled with the reinforcing fibers.

62. The reinforcing mat according to claim 61 wherein the transport components include transport fibers that contribute to providing longitudinal strength, shear strength and anti-skewing resistance sufficient to allow the reinforcing mat to be carried through the pultrusion die with the longitudinal fibers.

63. The reinforcing mat according to claim 61 wherein the transport components include a binder that contributes to providing longitudinal strength, shear strength and anti-skewing resistance sufficient to allow the reinforcing mat to be carried through the pultrusion die with the longitudinal fibers.

64. The reinforcing mat according to claim 61 wherein the transport components include at least one layer of randomly oriented staple fibers, some of which provide the staple fiber portions.

65. The reinforcing mat according to claim 61 wherein the entangling staple fibers are hydro-entangled.

66. The reinforcing mat according to claim 61 wherein the entangling fibers have a bending resistance less than a bend resistance of the reinforcing fibers.

67. The reinforcing mat according to claim 61 wherein at least a portion of the entangling fibers are heat bonded to the reinforcing fibers.

68. The reinforcing mat according to claim 61 wherein the reinforcing fibers extend continuously across the full transverse width of the reinforcing mat.

69. The reinforcing mat according to claim 61 wherein the reinforcing fibers are oriented at an angle of about 90° with respect to the longitudinal direction.

70. The reinforcing mat according to claim 62 wherein the transport fibers include fibers extending diagonally across substantially the full transverse width of the reinforcing mat and at an angle with respect to the reinforcing fibers.

71. The reinforcing mat according to claim 62 wherein the transport fibers include stitched fibers.

72. The reinforcing mat according to claim 62 wherein the transport fibers include fibers extending in substantially in the longitudinal direction.

73. The reinforcing mat according to claim 61 wherein the longitudinal fibers include stitched fibers.

74. The reinforcing mat according to claim 61 wherein the reinforcing fibers comprise glass and the entangling fibers comprise polyester.

75. The reinforcing mat according to claim 61 comprising a plurality of holes through the thickness of the reinforcing mat.

76. The reinforcing mat according to claim 75 wherein the plurality of holes through the thickness of the reinforcing mat are punched.